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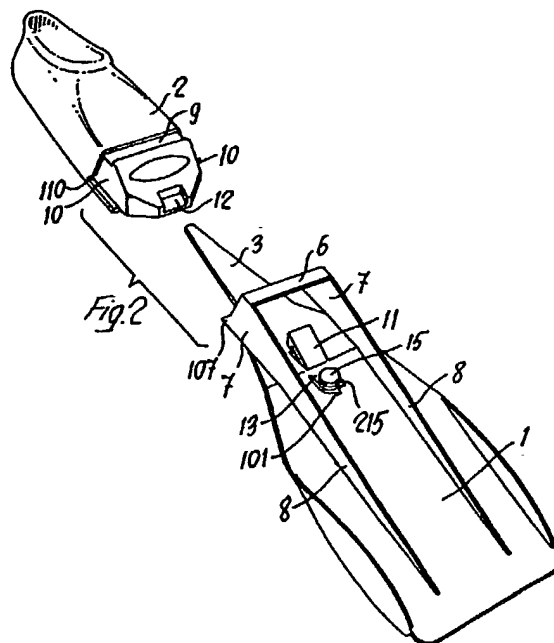
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(54) **Swim fin with separable blade portion and shoe portion.**

(57) This invention relates to a swim fin wherein the propulsion blade portion (1) and the shoe portion (2) are manufactured separately and are disconnectably connected to each other by means of suitable connecting members. The propulsion blade (1) comprises, at the end thereof facing said shoe portion (2), a flattened tang portion (3) which will be fitted, upon connecting the two portions (1, 2) of the fin, into a correspondingly shaped recess (4) in the thickness of the sole (5) of said shoe portion (2). The propulsion blade (1) of said swim fin is also provided, overhead at said tang portion (3), with a transverse bridge member (6) which is supported at both sides by two ridges (7) constructed as extensions of two intermediate ribs (8) of said propulsion blade (1), said bridge member (6) and side ridges (7) interengaging, upon connecting the two portions (1, 2) of said fin, with corresponding seatings or sockets (9, 10) formed in the toe portion of said shoe (2). Moreover, the swim fin is provided with a device (15) for locking together its coupled portions.



EP 0 310 828 A2

# Swim fin with separable propulsion blade portion and shoe portion

This invention relates to a swim fin of the type wherein the propulsion blade portion and the shoe portion are manufactured separately and are disconnectably connected to each other by means of suitable connecting members.

In the conventional swim fins of this type, the blade portion is usually provided at the rear end thereof, i.e. the end facing the shoe portion, with two longitudinal lateral extensions designed to be fitted into corresponding seatings or sockets formed in enlargements at the sides of said shoe portion. Said enlargements give the shoe portion a certain stiffness which makes it difficult to put on and uncomfortable to walk. Moreover, with some conventional swim fins of this type, the propulsion blade comprises, between the two lateral extensions thereof, a cage-like structure which is engaged with the toe of the shoe portion to help interconnecting said two portions. Said coupling means renders the construction of the flipper complicated, and entails difficult operations to couple the two portions thereof.

This invention aims to overcome said disadvantages and for this purpose it provides a swim fin of the type described in the preamble, wherein the means for coupling said two portions together, which is extremely simple *per se*, ensures a perfect solidarization thereof with a quick and easily conceivable operation, without affecting the softness characteristics of the shoe portion.

According to an important feature of the swim fin according to the invention, the propulsion blade comprises, at the end adjoining the shoe portion, a flattened tang portion which is at a small angle to the body of said shoe portion and is designed to be fitted into a recess of corresponding shape, formed in the thickness of the sole of said shoe portion.

At said tang portion, said blade comprises an upper transverse bridge member which is supported at both sides by two side ridges constructed as extensions of two intermediate ribs of said blade, said bridge member and side ridges interengaging, upon interconnecting the two portions of the swim fin, with corresponding seatings or sockets formed in the toe portion of said shoe.

According to a further important feature, the swim fin according to the invention comprises a small snap-detent which ensures the connection between the two portions thereof.

These and further features of the swim fin of the invention, and the advantages resulting therefrom will become apparent from the following detailed description of a preferred embodiment there-

of, selected as a non-limiting example and shown in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a swim fin according to the invention, the blade and shoe portions being interengaged.

Fig. 2 is a similar perspective view of said swim fin, the blade and shoe portions being separated.

Fig. 3 is a vertical longitudinal section of said swim fin, the blade and shoe portions being interengaged.

Fig. 4 is a vertical longitudinal section of the shoe portion of said swim fin.

Fig. 5 is a vertical longitudinal section of the rear portion of the propulsion blade of said swim fin.

Fig. 6 is a perspective view of a detail of said blade, comprising a detent for locking said blade to the shoe portion.

Fig. 7 is a sectional view of said locking detent in a disengaged condition.

In the drawings, the numeral 1 indicates the blade portion and 2 indicates the shoe portion of a swim fin according to the invention, said blade and shoe portions being constructed as separate members and being disconnectably interconnected by suitable coupling means.

The blade 1, which may be made of any suitable flexible material, either metallic, such as aluminum, or plastics, comprises at the rear end thereof, facing the shoe portion 2, a flattened tang portion 3 of substantially triangular configuration and at a small angle to the body of said blade. Said tang portion 3, of unitary construction with the blade 1 proper, is fitted, upon coupling the two fin portions together, into a correspondingly shaped recess 4 formed in the sole 5 of the shoe portion 2 which usually is made of rubber-like soft plastics material.

Moreover, said blade 1 comprises, just above said tang portion 3, a transverse bridge member 6 which is supported at both sides by two ridge-members 7 which extend on the top surface of the blade so as to constitute a pair of stiffening ribs therefor. Correspondingly formed in the toe of the shoe portion 2, are a transverse groove 9 and two lateral flat seatings 10 which, upon connecting the two portions of the swim fin, will be engaged by said bridge member 6 and ridge-members 7 of the blade portion, respectively.

More particularly, said ridge-members 7 comprise a small triangular lug 107, co-planar with said ridge-member and extending towards said shoe portion. Each lug 107 is designed, upon assem-

bling the swim fin, to fit into a mating recess 110 in the respective seating 10 of the shoe portion.

By the action of the coupling means described above, the shoe portion 2 will be practically clamped between the tang portion 3 and the bridge member 6 of the blade, whereby the former will be perfectly united to the latter. Said lugs 107 prevent said tang portion 3 and bridge member 6 to be spread apart when the blade is under stress.

To make the union between said blade and shoe even more reliable, the swim fin according to the invention comprises a snap-detent locking device. Said snap-detent device comprises a flexible detent 11 formed in the tang portion 3, particularly in the area thereof joining the body of the blade 1. Upon connecting said blade and shoe portions together, said detent 11 will engage by a snap action with a catch 12 formed on the toe of said shoe, so as to firmly connect the two fin portions together.

Said locking device, additionally, comprises means to easily lift said detent 11 to separate the two fin portions. Said means comprises a tongue 13 which is formed by cutting through the blade at the area where said detent 11 joins the tang portion 3, so that by manually depressing said tongue downwards said detent will be moved upwards, the narrow strip of material 14 between the former and the latter acting as a hinge (see Fig. 7).

Said locking device is provided also with safety means against any inadvertent actuation of the tongue 13. Said means comprises a small knob 15 rotatably mounted on the tongue 13 through a spindle 115, and provided with a radial pin 215 which normally, by striking against the edge of the slot defining said tongue 13, prevents any actuation of the latter. However, said actuation can be effected by purposely rotating said knob 15 so as to bring said pin 215 in register with a notch 101 formed in the edge of said slot.

A swim fin according to the invention has, when compared to the conventional swim fin of the same type, several advantages including:

- firm connection between blade and shoe portions;
- easy connection and disconnection of the two fin portions;
- good fitting of the shoe;
- simple general construction.

### Claims

1 - A swim fin wherein the blade portion (1) and the shoe portion (2) are manufactured separately and are disconnectably connected to each other by means of suitable coupling means, characterized in that the blade portion (1) comprises, at the end thereof adjoining the shoe portion (2), a

flattened tang portion (3) which, upon connecting the two fin portions (1, 2) together, is fitted into a correspondingly shaped recess (4) formed in the thickness of the sole (5) of said shoe portion (2).

2 - A swim fin according to Claim 1, wherein the blade portion (1) comprises, overhead at said tang portion (3), a transverse bridge member (6) supported at both sides by two ridge-members (7) constructed as extensions of two intermediate ribs (8) of the blade portion (1), said bridge member (6) and ridge-members (7) interengaging, upon connecting the two portions (1, 2) of said fin, with corresponding seatings (9, 10) formed in the toe of said shoe portion (2).

3 - A swim fin according to any one of the preceding Claims, wherein the tang portion (3) of the blade portion (1) is of substantially triangular configuration.

4 - A swim fin according to any one of the preceding Claims, wherein the tang portion (3) of the blade portion (1) is at a small angle to said blade portion (1).

5 - A swim fin according to any one of the preceding Claims, wherein said tang portion (3) of the blade portion (1) is of unitary construction with said blade portion (1).

6 - A swim fin according to any one of the preceding Claims, wherein the seating formed in the toe of the shoe portion (2) and corresponding to said bridge member (6), is constituted by a transverse groove (9).

7 - A swim fin according to any one of the preceding Claims, wherein the seating formed in the toe of the shoe portion and corresponding to one single supporting ridge-member (7) for the bridge member (6) of the blade (1), is constituted by a corresponding flat-bottom embossing (10).

8 - A swim fin according to any one of the preceding Claims, wherein said single ridge-member (10) for supporting the bridge member (6) of the blade portion (1) comprises a triangular lug (107), co-planar with the ridge-member (7) and extending towards the shoe portion (2), said lug (107) being designed, upon assembling the two portions (1, 2) of the fin, to fit into a mating recess (110) of the corresponding embossing (10) of the shoe portion (2).

9 - A swim fin according to any one of the preceding Claims, wherein a locking device is provided to lock the two coupled portions (1, 2) together.

10 - A swim fin according to Claim 9, wherein said locking device comprises a small flexible detent (11) formed in the tang (3) portion of the blade portion (1), particularly in the area thereof joining the body of said blade portion, said detent (11)

being designed to engage by a snap action, upon connecting said blade and shoe portions (1, 2), with a catch formed on the toe of said shoe portion (2).

11 - A swim fin according to Claims 9 and 10, wherein said locking device comprises means whereby said detent (11) can be easily lifted, so as to be able to separate the two portions (1, 2) of the fin.

12 - A swim fin according to Claim 11, wherein said means for lifting the detent (11) comprises a tongue (13) which is formed by cutting through said blade portion (1) at the area where said detent (11) joins the tang portion (3), so that by manually depressing said tongue (13) downwards said detent (11) will be moved upwards, the narrow strip of material (14) between the former and the latter acting as a hinge.

13 - A swim fin according to Claim 12, wherein said tongue (13) is operatively associated with a safety device preventing its inadvertent actuation.

14 - A swim fin according to Claim 13, wherein said safety device comprises a small knob (15) rotatable on the tongue (13) and provided with a radial pin (215) which permits the actuation of said tongue (13) only when said pin (215) is in registry with a notch (101) formed in the edge of the slot defining said tongue, and which prevents said actuation when it is in any other position, in that it strikes against the edge of said slot.

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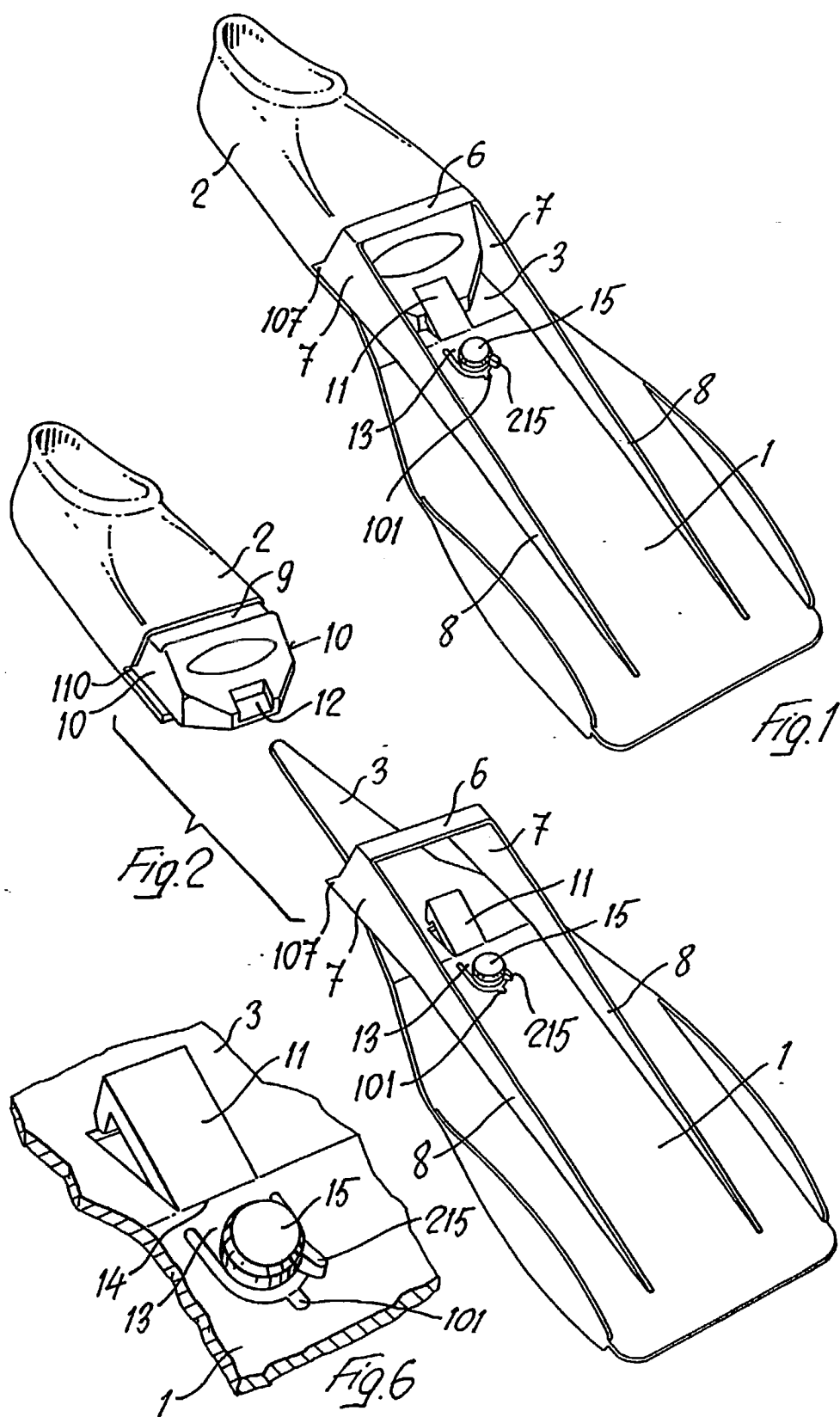
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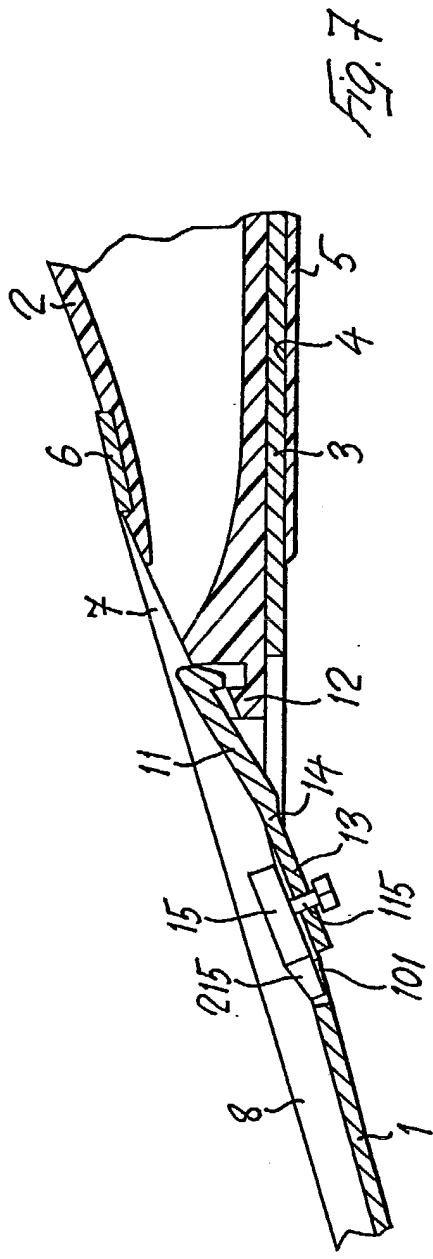
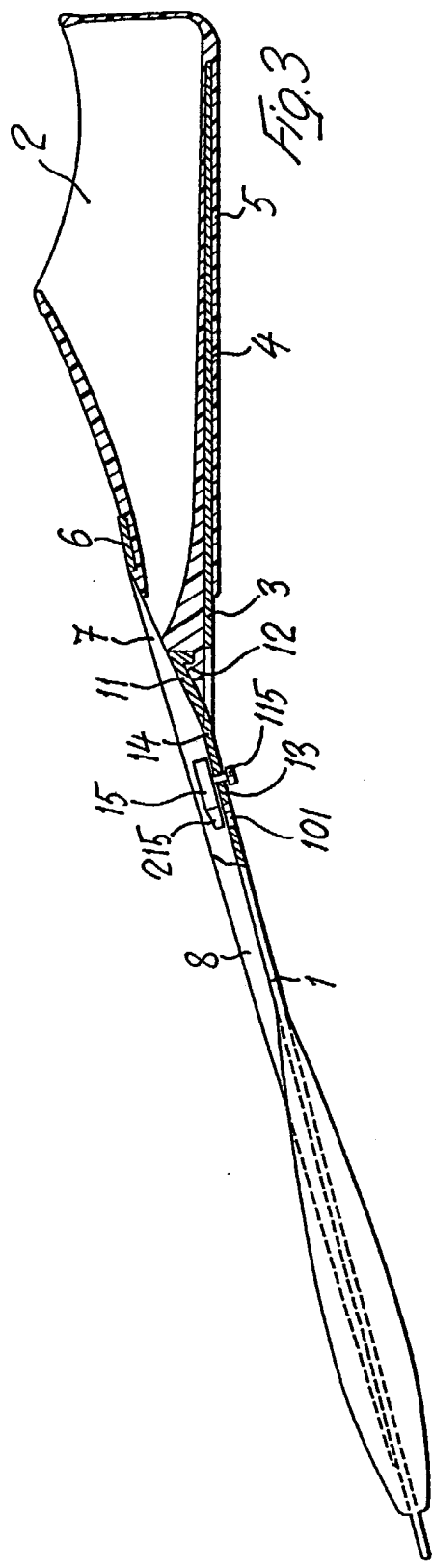
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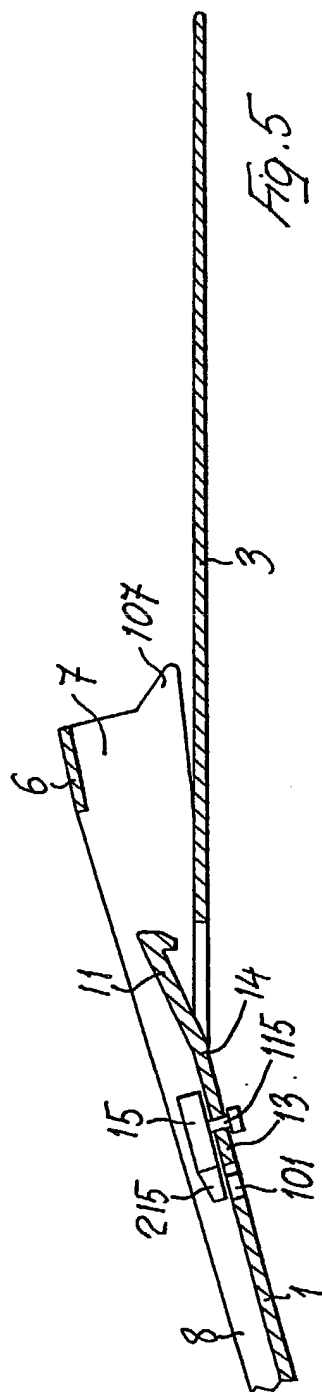
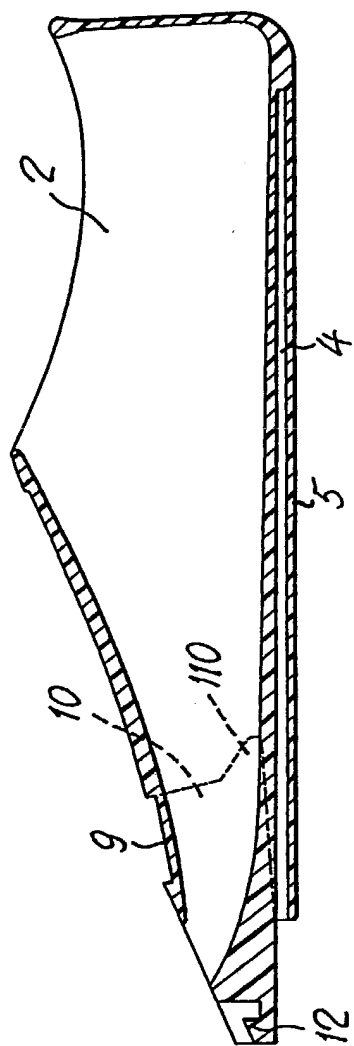
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March 26, 1968

A. M. PETERSON

3,375,044

HANDLE ADAPTER FOR TOOLS

Filed May 4, 1967

Fig. 1

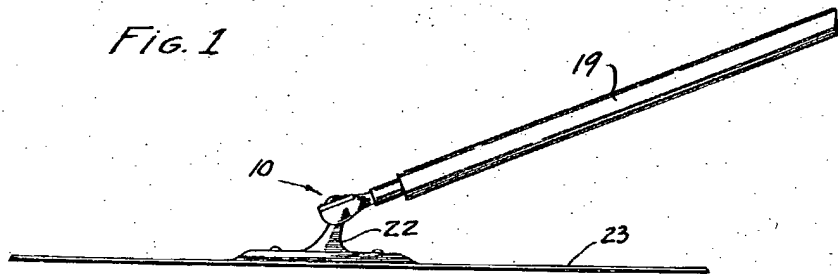


Fig. 2

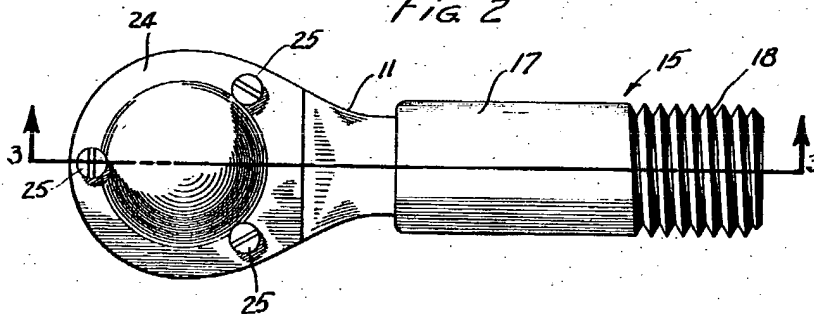
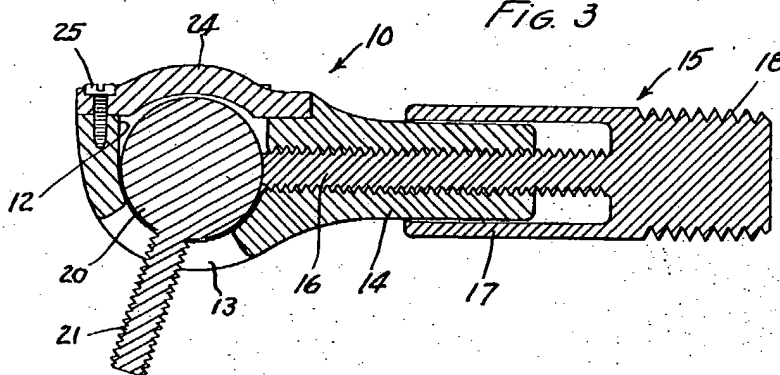


Fig. 3



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3,375,044  
HANDLE ADAPTER FOR TOOLS  
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Filed May 4, 1967, Ser. No. 636,093  
1 Claim. (Cl. 306-9)

## ABSTRACT OF THE DISCLOSURE

An adapter for connecting tools and tool handles, including a housing, a ball in the housing having a threaded stem projecting through a slot in the housing, a cover plate allowing easy access to the ball and removal of the ball from the housing and a coupling having a shaft threaded into the housing through a boss thereof and a sleeve slidable around the boss.

### Brief description

This invention relates to adapters used to interconnect a handle and a tool proper. It is particularly concerned with providing such an adapter that will allow pivotal movement of the tool with respect to the handle and that will immobilize the tool with respect to the head.

In the past a number of universal type connectors have been developed to interconnect special tools and handles, and some of these have been constructed to allow for easy adjustment and locking of the tool with respect to the handle. However, there remains a need for such an adapter that is easily and economically constructed, that will provide easy and positive locking of the handle with respect to the tool and that can be used with a variety of tools.

Principal features of the invention include the cover plate closed ball receiving housing, a universal ball having a threaded stem projecting through a slot in the housing for connection with a tool, and a coupling, threaded at one end to connect to a handle, provided with a stem, threaded through a boss into the housing to bear against and immobilize the ball.

There is shown in the accompanying drawing a specific embodiment of the invention representing what is presently regarded as the best mode of carrying out the generic concepts in actual practice. From the detailed description of this presently preferred form of the invention, other more specific objects and features will become apparent.

### The drawing

FIG. 1 is a side elevation view of the adapter, as used with a cement finishing tool and handle;

FIG. 2, an enlarged, top plan view of the adapter; and

FIG. 3, a vertical section view, taken on the line 3-3 of FIG. 2.

### Detailed description

In the illustrated preferred embodiment, the adapter of the invention, shown generally at 10, includes a housing 11, with a concave interior 12, formed in a large end, and a slot 13 formed through the wall of the housing, opposite the mouth of the concave interior.

At one side of the housing, between the mouth of the concave interior and the slot 13, a boss 14 is formed as part of the housing.

A coupling 15 includes a stem 16 that is threaded through boss 14 and a sleeve 17 that extends around the boss. The exterior surface of coupling 15, at the end opposite stem 16 is threaded (as at 18, for easy connection to a handle 19, FIG. 1.

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A ball 20 having a threaded stem 21 projecting therefrom is positioned in the concave interior 12, with the stem 21 projecting through slot 13 to be easily threaded into a receiving plate 22 connected to the tool 23.

A cover plate 24 is provided to fit over the mouth of the concave interior 12 and self-tapping screws 25 are inserted through holes 27 in the cover plate and into housing 11 to hold the ball in place.

In use, stem 21 is tightly threaded into receiving plate 22, and the handle 19 is threaded onto coupling 15. The handle and the coupling are turned to back stem 16 away from the ball and the handle is rotated horizontally and vertically to desired position. Thereafter, the handle and connector are rotated in the opposite direction until stem 16 abuts ball 20 to snub it tightly against the inner wall of the concave interior. The tool is thus firmly held with respect to the handle.

While the tool 23, illustrated, is a bull-float for use in concrete finishing work, it should be apparent that the adapter could as well be used with other tools.

When the ball is locked tightly in position, it seals slot 13, cover plate 24 seals the mouth of the concave interior, and the sleeve 17 fits closely around boss 14 to provide an effective seal. Material cannot, therefore, accumulate in the housing to prevent free movement of the housing with respect to the ball.

Whereas this invention is here described and illustrated with respect to a certain form thereof, it is to be understood that many variations are possible without departing from the subject matter particularly pointed out in the following claim, which subject matter I regard as my invention.

### I claim:

1. An adapter for connecting a tool and a handle for the tool, comprising
  - a housing having a concave spherical interior surface and an open end, a slot through the housing on the side opposite the open end of the housing, and an interiorly threaded boss extending from one side of the housing between the open end and the slot;
  - a spherical ball seated on the spherical concave interior surface and closing said slot, said ball having a threaded stem projecting therefrom through the slot for receiving a tool;
  - a cover plate removably fastened to and closing the end of the housing and engaging and holding the ball on the spherical concave interior surface;
  - a stem threaded into said boss and being long enough to engage and snub the ball against the housing interior;
  - a sleeve integral with one end of said stem and slidably extending closely around said boss in sealing engagement therewith; and
  - a threaded stud on the end of said sleeve adapted to have a handle threaded thereon.

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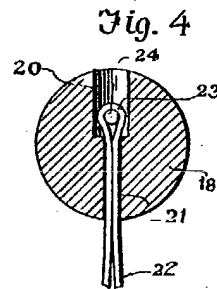
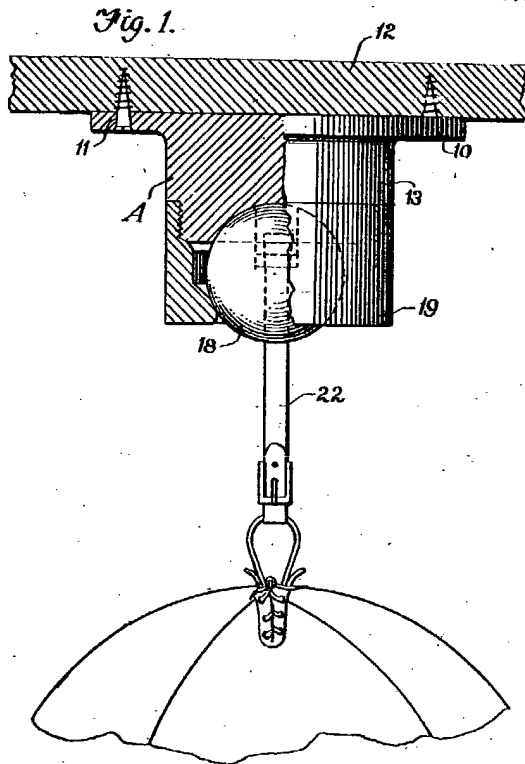
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M. R. SCHALL

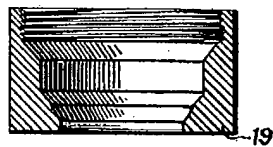
1,504,910

BAG SWIVEL

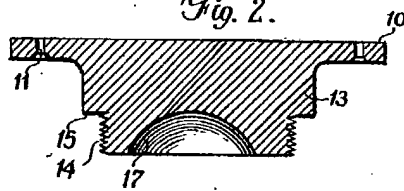
Filed Dec. 2, 1922



*Fig. 3.*



*Fig. 2.*



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Patented Aug. 12, 1924.

1,504,910

# UNITED STATES PATENT OFFICE.

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BAG SWIVEL.

Application filed December 2, 1922. Serial No. 604,539.

*To all whom it may concern:*

Be it known that I, MYRON B. SCHALL, a citizen of the United States, residing at Monte Vista, in the county of Rio Grande and State of Colorado, have invented new and useful Improvements in Bag Swivels, of which the following is a specification.

This invention relates to supports for punching bags or the like.

It is the purpose of this invention to provide absolutely noiseless swivel support for punching bags, and one which will work with the desired degree of smoothness and accuracy.

Another object of the invention resides in the provision of means, in the nature of a strap for attaching the bag thereto, and permitting proper adjustment of the strap as the occasion requires, and thereby eliminating knotting of the cord within the swivel as is usually done.

The nature and advantages of the invention will be better understood when the following detail description is read in connection with the accompanying drawings, the invention residing in the construction, combination and arrangement of parts as claimed.

In the drawings forming part of this application, like numerals of reference indicate similar parts in the several views, and wherein:

Figure 1 is a view partly in section, showing the bag support with the rope of said bag attached thereto.

Figure 2 is a detail view of the socket member.

Figure 3 is a similar view partly in section of the removable cap.

Figure 4 is a sectional view through the ball member showing the strap associated therewith.

In carrying out the invention, I provide a ball and socket support, which is absolutely noiseless, and one which works very smoothly and accurately. The socket member is indicated generally at A, and includes an attaching plate 10 having an opening 11 to receive suitable fastening elements for securing the plate to the platform 12. Projecting from one side of this plate is a cylindrical portion 13 which is reduced and threaded as at 14, the reduced portion defining an annular shoulder 15. The reduced portion is formed to provide a socket 17 to accommodate the ball 18 as shown. The

ball is retained within its socket by means of a cap 19 which is threaded on the reduced portion 14 and which bears against the shoulder 15 above referred to. The cap is provided with a central opening at one end through which the ball partly projects, and which permits perfect freedom of movement of the ball within the cap and said socket. The construction and arrangement of parts is such, that the ball works very smoothly and accurately within the socket, and thus eliminates that metallic rattling and noise usually present with other devices of somewhat similar character, and which noise is usually very aggravating to the user of the bag. It is, of course, to be understood that the ball is properly lubricated to insure smoothness of operation and accuracy.

The ball is provided with large and small communicating bores 20 and 21 respectively and projecting from the small bore is a strap 22, including a buckle, by means of which the strap can be adjusted to properly position the ball with relation to the platform. The strap is looped at one end as at 23, this looped portion of the strap receives a small piece of steel 24 which together with the loop is fitted within the large bore 20 of the ball to hold the strap associated with the latter. This construction allows the strap to be quickly and easily attached to the ball and adjusted to properly position the ball with relation to the platform, eliminating knotting of the rope supporting the ball, within the swivel member which is usually necessary in device of this kind.

While it is believed that from the foregoing description, the nature and advantages of the invention will be readily apparent, I desire to have it understood that I do not limit myself to what is herein shown and described and that such changes may be resorted to when desired as fall within the scope of what is claimed.

Having thus described the invention, I claim:

1. In a device of the character described, an attaching plate, a socket member supported by said plate, a ball swivelled in said socket member and having a bore opening at both ends, a looped strap projecting from one end of the bore, and an element received by the loop formed by said strap and positioned in the bore of said ball for holding the parts associated.

2. In a striking bag suspension device, a

universally supported ball having a recess therein which opens upon one side of the ball and further provided with an elongated slot in communication with one end of the recess and open upon the ball at a point diametrically opposite that end of the opening which opens upon the ball, a pin extending transversely through the recess and a looped strap passing through the slot and engaged with the pin, the strap being adapted to be attached to a striking bag.

In testimony whereof I affix my signature.

MYRON R. SCHALL.